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Records for Inventory Control, Communication, and Scheduling

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Record Keeping For Hog Producers

Records for Inventory Control, Communication, and Scheduling

by David Bache

INTRODUCTION

The other publications of this series are devoted to records which represent a history of performance. Such historical information is essential to pay your taxes, evaluate productivity, select breeding stock, etc. However, most historical records do little or nothing to help avoid problems or to give an early warning of developing ones. This publication is devoted to records aimed at these concerns. The forms and procedures discussed are designed to:

--help plan for full and efficient use of facilities while avoiding crises caused by overproduction.

--monitor feed and animal inventory to detect theft, waste, errors, slow gains, and unproductive breeding animals.

--aid communication between workers.

--serve as a prompter to insure that operating procedures are performed on time.

--help avoid problems caused by such things as equipment failure, overuse of breeding animals, etc.

--detect problems with equipment and with herd health and encourage remedial action.

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There will be some useful ideas here for any hog producer. But their importance will vary depending upon the size of the unit and the production practices used. Consider the following questions:

Is yours essentially a one-man unit? If so, the communication problem will be reduced to the need to deliver messages to service men like the veterinarian or feed man and to provide necessary explanations to the occasional worker who replaces you in case of an emergency. But as the number of workers increases, so does the communication problem.

Is yours a tightly scheduled production plan? If you farrow one group of sows on a six-month cycle, you can be relaxed about many of the issues discussed here. As intensity increases, so does the need for scheduling, for development of routine operating procedures, for inventory control.

Do you process your own feeds? If you do, you need a system to monitor the accuracy of ration formulation and the use of regulated ingredients.

Do you deal with sows as farrowing groups, or as individuals? To benefit from hand-mating and dealing with sows as individuals, there must be procedures to maintain a tight production schedule, to monitor boar usage, to insure timeliness. If you pen-mate and deal with sows as groups, there is less need for and less opportunity to use the ideas discussed here.

Contents

Record Keeping for Hog Producers

The development of this series of publications was made possible by special project funding from the United States Department of Agriculture--Extension Service. The ideas presented here have been developed through close cooperation among the national extension service, the state universities, and the pork production industry. Errors and oversights are the responsibility of the primary authors.

This publication is one of six in a series, each designed to be a self-contained unit. Yet the relationship between this and the other five publications is of critical importance. Each publication (section) in the series is identified by a Roman numeral for purposes of reference back and forth among the six subject areas. Tables, exhibits, recording forms and reports also are identified with a combination of Roman and Arabic numerals. For instance, Table VI-1, Performance Measure for the Swine Herd, is the first table in EC-601 (section VI); it is found in that publication although it may be referred to in others. EC-602 consists of blank recording and report forms for your own operation.

Do you have a production line building with a variety of different kinds of pens designed to perform different functions? If so, the scheduling of most of your activities may be automatic as breeding animals cycle through the system and market animals move through it. You may not need any other scheduling device.

AN INVENTORY CONTROL SYSTEM

Feed Ingredient Inventory

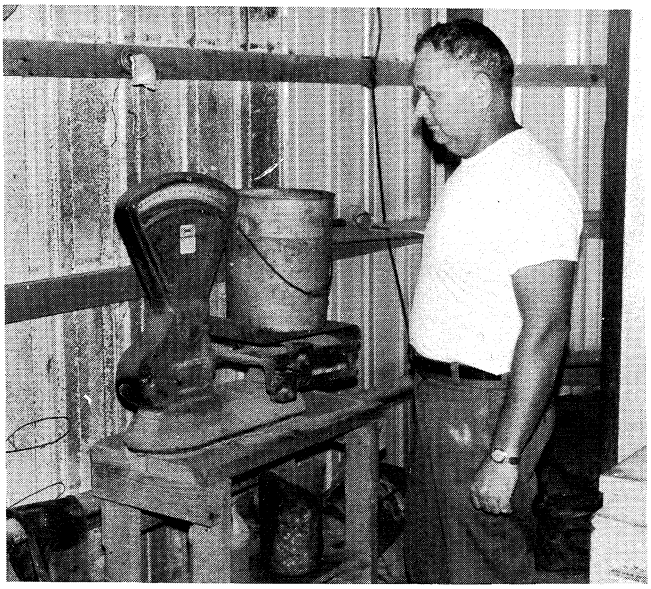
The inventory procedures described here are more elaborate than those in EC-598, Cost of Production Records. There, Recording Form III-7 is provided for recording the quantity in inventory at the beginning and end of an accounting period. The procedure described here yields a constantly updated inventory: it monitors the movement of feed ingredients through the system.

There are several good reasons for the importance of feed inventory control. It is a method of detecting billing or weighing errors made by the suppliers of feed ingredients. Feed inventory control is also responsive to the regulations of the Food and Drug Administration covering Good Manufacturing Practices for Medicated Feeds.[1] These regulations require a daily inventory record for each drug. They also require records of the amount of each drug used daily, and of the disposal of each batch of medicated feed.

Inventory control provides a check of actual against planned usage. It lets you know whether the rations are properly formulated. This is especially important for those who blend ingredients with volumetric measuring devices (variable speed augers, etc.). It is also important for those who weigh ingredients because it provides a check on human error and inaccurate scales.

Report V-1 is designed to provide feed inventory control. Its use is illustrated here with data from Bryan Dennis, a hypothetical farrow-to-finish hog producer. Mr. Dennis prepares five different rations with an automatic electric grinder-blender. His eight feed ingredients are listed across the top of Report V-1. As he grinds feed, he records the pounds of each ingredient used and the balance that should be left in inventory. If the inventory of an ingredient can be weighed, Bryan has constant control of the accuracy of use. He gets this by comparing the actual inventory with the calculated inventory.

Bryan purchases soymeal in 10-ton bulk lots. His procedure for monitoring that ingredient involves beginning a new worksheet when a shipment of soybean meal is delivered. When he runs out of soybean meal, he takes an "Actual Inventory" of all ingredients (2nd line from the bottom) and completes the worksheet. His electric mill draws corn directly from a 10,000-bu. capacity bin. His accuracy in inventorying corn is so low that he does that only once a year. So



Calibrate the mill periodically as a check on the proportion of corn in the various rations.

[1] Food and Drug Administration, Department of Health, Education, and Welfare, Good Manufacturing Practice Regulations, Title 21, Chapter 1, Part 225, "Medicated Feeds."

Report V-1. Hog Inventory Worksheet.

Date	Ration	Delivered To	Ingredient Inventory: Corn Use	Corn Balance	Soy Meal Use	Soy Meal Balance	Premix Use	Premix Balance	Wean Premix Use	Wean Premix Balance	Pot. Chloride Use	Pot. Chloride Balance	Vitamin Pak Use	Vitamin Pak Balance	Furox-50 Use	Furox-50 Balance	Tylan 10 Use	Tylan 10 Balance
12/3/81	Carried Fwd.			282,500		20,000		1,800		1,100		125		32		12		50
12/6	Grower	Bin #3	5916	276,584	1800	18,200	280	1,520					4	28				
12/6	Weaner	Bin #2	2750	273,834	850	17,350			400	1000								
12/7	Gestation	Bin #5	3220	270,614	600	16,750	180	1,340										
12/7	Lactation	Bin #1	2980	267,634	800	15,950	180	1,160			30	95			10	2		
12/7	Finish	Bin #4	6930	260,704	1800	14,150	270	890									22.5	27.5
12/11	Grower	Bin #3	5916	254,788	1800	12,350	280	610					4	24				
12/12	Gestation	Bin #5	3220	251,568	600	11,750	180	430										
12/12	Finish	Bin #4	6930	244,638	1800	9,950	270	160									22.5	5.0
12/15	Buy 50# Furox-50															52		
12/15	Buy 4000# Premix							4160										
12/16	Grower	Bin #3	5916	238,722	1800	8150	280	3,880					4	20				
12/17	Finish	Bin #4	6930	231,792	1800	6,350	270	3,610										
12/19	Gestation	Bin #5	3220	228,572	600	5,750	180	3,430										
12/23	Grower	Bin #3	5916	222,656	1800	3,950	280	3,150					4	16				
12/23	Weaner	Bin #2	2750	219,906	850	3,100			400	600								
12/24	Lactation	Bin #1	2980	216,926	800	2,300	180	2,970			30	65			10	42		
12/24	Finish	Bin #4	6930	209,996	1800	500	270	2,700										
12/26	Gestation	Bin #5	2680	207,316	500	—	150	2,550										
Total Used			85,184		20,000		3250		800		60		16		20		45	
Actual Inventory			—		+350		2550		600		59		15		42		7	
Discrepancy			—		+350		—		—		-6		-1		—		+2	

he must calibrate the mill periodically as a check on the proportion of corn in the various rations. But any problem with the proportion of the other ingredients is detected and corrected before use of soybean meal from a new shipment begins.

Animal Inventory

The system described here uses inventories to predict and then to monitor sales, purchases, mortality, and the flow of animals between buildings and from one production stage to another. The animal inventory system emphasizes predictions or targets as a help in cash-flow projection and to provide an early warning of evolving problems.

There is a growing awareness among pork producers of the importance of controlling the inventory of animals. Some reasons for the interest are:

1. For those using expensive facilities, economical production demands full usage. Management needs a system that permits a quick response to budding problems with occupancy rates and flows. For instance, it may be valuable to know how many pigs per crate were produced on your farm last year. But it will be much more useful to know you fell behind in the number of gestating sows on hand last month so you can make up for it this month.

2. On some farms, animal inventory data are already available waiting for a system of analysis.[2] With periodic inventories, it is a short step to the use of the data to predict the flow of hogs and the resulting cash.

3. Financial problems caused by a 2-1/2 year (mid-1979 till early 1982) lean period for hog producers have increased awareness of the need for accuracy in forecasting marketings. And a prompt updating of cash-flow projections is needed when production targets will be missed.

4. There is increasing awareness of the economic importance of the growing-finishing stage and of the need to shift emphasis a bit from sow herd performance to growing-finishing performance. Measuring growing-finishing performance as "Average Rate of Gain" or "days to 230 lbs."[3] is difficult for farrow-to-finish operators. However, with periodic inventories, the measurement of the flow of hogs is easy, and it is a direct reflection of "Average Rate of Gain." Flow reports make it possible to detect problems before they become ancient history.

5. With hired labor units, absentee management needs a system to reveal occupancy rates, mortality, theft, and to compare the performance of different buildings and of different people.

As you read further, you will find a suggested format for two animal inventory reports. Also presented is a data collection plan. In each case figures from the Bryan Dennis farm are used to demonstrate the use of the form. Bryan produces about 1,500 farrow-to-finish hogs per year. The sow herd is maintained in three groups and sows are group-mated. Blank copies of each of the reports and recording forms in this publication are available separately (EC-602).

Report V-2, Animal Inventory Control: Buildings and Life Cycle Groups provides control over the flow and disposition of animals. Producers who take the time to prepare such a report will have a system to monitor building occupancy rates and the number of breeding herd animals in

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[2] See the discussion of the Inventory Problem and of Recording Form III-1, Hog Inventory, in EC-598, Cost of Production Records.

[3] See EC-601, Records to Measure Production and Productivity and to Monitor Herd Health.

Report V-2 Animal Inventory Control: Buildings and Life Cycle Groups

Period _____ Beginning Date _____ Ending Date _____

1. Target Inventory	Category	2. Beginning Inventory	3. Added	4. Total In	5. Sales	6. Deaths	7. Transferred Out	8. Ending Inventory	9. Total Out
—	Cull Sows & Boars	0	27	27	12	0	0	15	27
67	Sows & Gilts: Gestating	58	36	94	0	1	29	64	94
—	Breeding	40	40	80	4	—	36	40	80
—	Developing Gilts	40	42	82	—	—	40	42	82
4	Boars	8	—	8	2	—	—	6	8
33	Sows with Pigs	27	29	56	—	—	27	29	56
264	Suckling Pigs	222	174	396	—	22	215	159	396
256	Nursery	260	215	475	—	13	252	210	475
256	Grower	215	252	467	—	4	211	252	467
256	Finisher	182	211	393	142	—	42	209	393
1136	Total	1052	1026	2078	160	40	852	1026	2078

Completing Report V-2:

Column #1 Record here the number of animals you hope to have in each building and category. This will be based on building capacities and production goals.

Column #3 Record here any animal purchased, born or transferred-in. For each transferred-in entry, there must be an equal "Transferred-out" entry on the appropriate line. For instance, since 42 gilts were selected from finishing, an entry of 42 appears in column 3 of the Developing Gilts line and also in column 7 of the Finishing line.

Column #4 is the total of columns 2 and 3. This is the total number of animals to be accounted for. For each line, column 4 and 9 should be equal. Otherwise, there is either an error or missing data.

Column #9 is the total of columns 5, 6, 7 and 8.

various categories. In addition, the system will lead them to balance the account of the flow of animals through individual buildings so they detect any missing or unrecorded animals.

Among the data needed for Report V-2 are beginning and ending inventories. These list breeding herd animals by category and market animals according to the building they occupy. Other data needed are counts of live pigs born and of purchases, transfers, deaths, and sales.

A particular user of an inventory control system might want more or less precision than suggested by the choice of lines in Report V-2. Each operator should prepare his own list of line items. He should choose those providing useful information for him. For instance, there might be good reason to add a line for "Sows Mated but Not Yet Diagnosed Pregnant." Or, if there is more than one building servicing the same life cycle stage, it may be very useful to compare them. This would lead to separate lines for Farrowing House #1 and for Farrowing House #2 or for Nurseries #1, #2, and #3, etc.

On the other hand, a particular producer might want to simplify the procedures suggested by Report V-2. Suppose a producer does not want to bother recording deaths. If he provides all the other information needed to complete Report V-2, he will be able to determine the number of animals dead or missing. For instance, Bryan Dennis does not record nursery deaths. However, since the number in column 9 (Total Out) must equal the number in column 4 (Total In), he can calculate the figure in column 6. Column 4 (475 pigs) minus the totals of columns 5, 7, and 8 (462 pigs) equals the number dead or missing (13 pigs).

The frequency with which a producer should prepare his version of Report V-2 will be determined by the length of his production cycle and by the needs of management. Management would probably want a monthly report from a hired-labor unit on a weekly farrowing schedule. For an owner-operator farrowing six times per year, quarterly reports should be adequate. Bryan Dennis is generating reports monthly. This happens to be a period when he is replacing his breeding herd, so the number of breeding animals in inventory is abnormally high.

Report V-3, Market Hog Inventory Control and Sales Projection monitors the growth rate of animals to detect those not performing at the expected rate. It also provides a prediction of marketings to be used in cash flow budgeting.[4]

The only data needed are inventory counts by weight categories. Weight group classification will be easy to do with a little practice. It is good to be prepared to make occasional spot-checks of pig weights with a hanging scale, a bathroom scale or an individual pig platform scale. For this report, it is not necessary to have precise weights --only to place animals within weight categories.

The sample layout shown in Report V-3 is designed for a monthly inventory. The accompanying instructions describe a way of choosing appropriate weight categories.

Gathering the Data. Some of the information required for Report V-2 will come from your office where you keep records of the number of animals sold and purchased. Number of pigs born alive will come from your farrowing records, and you may have the necessary records in the various buildings showing mortality and animals transferred in and out.

Both summary reports rely on inventories. Report V-2 requires a count of breeding animals in each life-cycle category. Both summary reports need

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[4] See Exhibit II-8, Cash Flow Record and Projection, EC-597, Tax and Financial Management Records.

Report V-3 Market Hog Inventory Control and Sales Projection

Period 31 days Beginning Date Dec. 1, 1981 Ending Date Jan. 1, 1982

1. Weight Category	2. Beginning Inventory	3. Target Ending Inventory & Sales	4. Actual Ending Inventory & Sales	5. Projected Sale Dates For Animals in Ending Inventory
30 to 70 lbs.	171	XXXXXXXXXXXXXXXXXXXXXXXXX	143*	May 1982
70 to 110 lbs.	91	169	31	April
110 to 150 lbs.	188	90	252	March
150 to 190 lbs.	48	186	120	Feb.
Over 190 lbs.	161	48	58	Jan.
Sales	XXXXXXXXXXXXXXXXX	159	184	XXXXXXXXXXXXXXXXXXXXXXXXX
Total	659	652	645	

Completing Report V-3:

Column 1. The choice of appropriate weight categories will be determined by: 1) the frequency of inventories, 2) average market weight, and 3) expected daily gains. For instance, the categories here (40 lbs. wide and 40 lbs. between midpoints) are appropriate for the Dennis' farm on which inventories are taken monthly, the average market weight is 230 pounds and expected daily gain is 1.3 pounds. So:
Width of weight category = expected daily gain X days between inventories
Or: Width = 1.3 X 30; Or: Width = 40 lbs.
And, the lower limit of the heaviest weight category should equal:
Average market weight - (daily gain X days between inventories)
To continue with the example: 230 - (1.3 X 30); Or 230 - 40 = 190 pounds

Column 2. is the actual count of animals at the end of the previous period.

Column 3. shows the expected progression of animals through the system. If the weight categories have been chosen as suggested in the discussion of Column 1, the figures in Column 2 will be expected to progress one category as they move into Column 3. That is, after a correction for expected mortality, the pigs listed on line 1 of Column 2 are expected to appear on line 2, of Column 3. Bryan Dennis expects mortality of 1/2 of 1% per month. The example figures reflect that.

Column 4. is the actual count of hogs in inventory at the end of the period. Also recorded here are sales during the period. The 184 head on the second line from the bottom is the total of 142 market hogs sold and 42 gilts selected for herd replacement during December. When a new report is prepared after another month, the numbers in Column 4 here will become the numbers in Column 2 of the new report. *Do not include the number in this blank in the total of this column.

Column 5. will give the month (or other appropriate time period) in which each group is expected to sell. Those hogs weighing over 190 lbs. are expected to go to market in the following month and each lighter weight category in its sequentially succeeding month.

inventory counts of market animals: the market animal count must be according to building for Report V-2 and according to weight category for Report V-3.

As a recording form to gather the necessary inventory information, it is hard to beat a floor plan of the hog buildings. The floor plan should show each building and each pen. The floor plan must be large enough so you can record the number of animals in each pen along with their weight category. Exhibit V-1, Hog Inventory Worksheet, illustrates the idea.

The facilities owned by Bryan Dennis, for which Exhibit V-1 is a floor plan, are fairly typical for modest-volume, fully confined production. There are three outside lots for breeding and early gestation. The last third of gestation is spent in gestation crates in the farrowing room. There are two small decks in the nursery, and the finishing building has an off-center aisle so more floor space can be provided for larger hogs.

COMMUNICATION AND SCHEDULING

The information gathered for communication and scheduling will have a short useful life. There is no profit in storing and summarizing these records.

Communication

Most of us need memory prompting, and a communication problem is sure to appear when more than one person works with the hogs. Any hog enterprise can be helped by improving self-communication (reminders) for the individual worker and by improving the exchange of information with any others involved. The good manager will be looking for a simple system of communication, one that permits messages to be easily prepared and read, and uses devices that are reusable or easily discarded.

The most commonly used communication record is a written message on the individual litter card fastened to the front of each farrowing crate. This tool works well and it can often be improved by designing the card so making a checkmark can substitute for writing a word.

When you design your litter card,[5] set aside a section for a list of standard operating procedures that can be checked off as they are accomplished. For example:

Piglet Processing

Ear Marked _____

Teeth, Tail _____

Iron #1 _____

Iron #2 _____

Castration _____

In addition, it is good to set aside a blank space on the card for comments on items that are not routine.

Since these messages are not a valuable addition to the permanent records, maybe the pencil can be eliminated and the written message replaced by other signals (e.g., a litter card turned 90° from its normal position means the litter has been processed). Or the card can be eliminated and spring clothespins used as signals to indicate various actions that have been taken (e.g., one clothespin indicates the litter was processed at birth; two clothespins indicate that the second iron shot has been given: three clothespins mark a problem litter).

One producer who deals with sows as individuals has devised a system using 3" x 5" cards. One is prepared for each sow at breeding. This card moves with her through the building complex until her next litter is weaned. Her card hangs above her gestation crate where it

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[5] A suggested format is provided as Recording Form IV-1, Litter Card, in EC-599, Records for Breeding Stock Selection and Culling.

Exhibit V-1

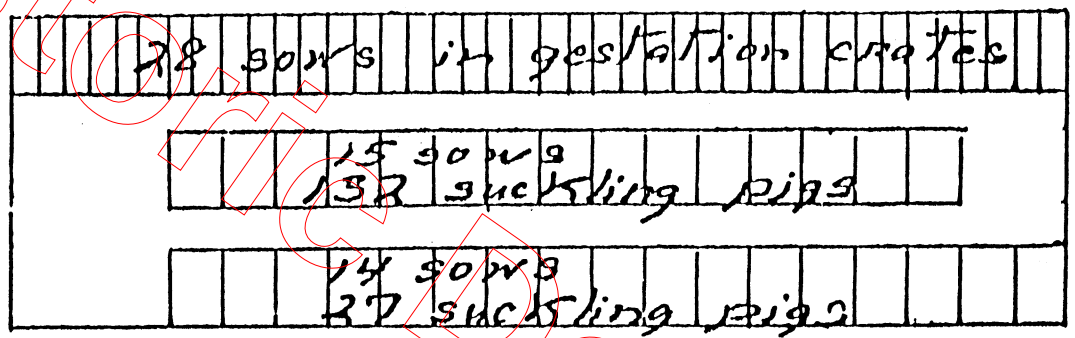
Hog Inventory Worksheet

Date Jan. 1, 1982

Breeding-
Gestation

Farrowing - Gestation

1. 3 boars 40 gilts
2. 36 bred gilts
3. 42 open gilts



Boars

3

Nursery

1 25 under 30 lbs	2. 21 under 30 lbs	3. 22 30 lbs - 70	4 27 30 lbs - 70
5 26 30-70	6 22 30-70	10 10 under 30 lbs / 7 20 30-70	8 26 30-70

Growing - Finishing

1 31 70-110	2 32 110-150	3 34 110-150	4 31 110-150	5 30 110-150	6 33 110-150	7 29 110-150	8 32 110-150
9 31 110-150	10 30 150-190	11 30 150-190	12 29 150-190	13 31 150-190	14 29 OVER 190	15 29 OVER 190	16 15 cull sows

is fastened to a wire line by a spring clothespin. If her white 3" x 5" card is turned 90°, it means she should be culled if she returns to heat. If a smaller green card is attached to the white one, she should receive an extra measure of feed. The tools are simple; the messages easily read.

By using chalkboard paint, many producers have prepared surfaces at various spots in their hog buildings where they write messages that are easy to read, to change, and to erase: "ship," "sick pig," "leaking fountain," etc.

Producers who hand-mate need a record of matings to help avoid overuse of individual boars. This is another example of a record that need not be permanent. However, it will be important for communication and to help in remembering. Some producers keep the necessary information on a chalkboard in the breeding area. Recording Form V-1 is a suggested format. An X or a checkmark there will record a mating. With such a record, you can avoid violating the recommendation of a maximum seven matings per week or two per day for a mature boar and five per week or one per day for an immature boar. Since there is little to be learned from a boar usage chart covering more than two weeks, the oldest data can be erased whenever the chart is full.

Scheduling

Scheduling Facilities. Before the advent of large, high investment production factories, the main consideration in scheduling hog production usually involved the avoidance of harsh weather and conflict with field crop operations. Scheduling was easy. If you wanted the first litters to begin arriving on March 1, you turned the boars in 113 days before that.

With controlled environment buildings and full-time labor devoted to the hogs, it is feasible to farrow at any time. With farrowing chambers the most expensive facilities in the complex, it is economically important to farrow often. With a given set of buildings, the limits on farrowing frequency are usually set by: willingness to forego the disease control advantages of all-in, all-out scheduling of farrowing and nursery facilities; decisions on when to wean (three- to six-week range) and where to wean (farrowing house vs. nursery); and

Recording Form V-1. Boar Usage Chart.

Boar Identif.	Matings													
	Sat	Sun	Mon	Tues	Wed	Thur	Fri	Sat	Sun	Mon	Tues	Wed	Thur	Fri

Recording Form V-2 page 1

Establishing a Breeding Schedule by Comparing the Reproductive Cycle to the Cycle of Farrowing Room Occupancy

For Facilities Shown in Exhibit V-1

Farrowing Room Occupancy		days	Reproductive Cycle		days
1.	Breeding period length	21	7.	Gestation period	113
2.	Days before farrowing	0	8.	Lactation in farrowing	21
3.	Lactation period	21	9.	Lactation in nursery	7
4.	Days after weaning	0	10.	Weaning to 1st heat	5
5.	Cleaning time	3	11.	Delay to later heat	—
6.	Total	45	12.	Total	146

13.	Trial number of groups per room (line 12 ÷ line 6)	3.2	groups
14.	Number of rooms	1	rooms
15.	Total number of groups (line 13 X line 14) rounded down to a whole number	3.	groups
16.	Actual number of groups per room (line 15 ÷ line 14)	3.	groups
17.	Occupancy per room to farrow all groups (line 6 X line 16)	135	days
18.	Extra time available in each farrowing room cycle (line 12 - line 17) ÷ line 16	3.7	days
19.	Breeding cycle length [(line 6 ÷ line 14) + line 18] rounded up to a whole day	49	days

Recording Form V-2 Establishing a Breeding Schedule by Comparing the Reproductive Cycle to the Cycle of Farrowing
page 2 Room Occupancy

Hand Mating

Farrowing Room Occupancy		days	Reproductive Cycle		days
1.	Breeding period length	7	7.	Gestation period	113
2.	Days before farrowing	0	8.	Lactation in farrowing	21
3.	Lactation period	21	9.	Lactation in nursery	0
4.	Days after weaning	0	10.	Weaning to 1st heat	5
5.	Cleaning time	3	11.	Delay to later heat	0
6.	Total	31	12.	Total	139

13.	Trial number of groups per room (line 12 ÷ line 6)	4.5	groups
14.	Number of rooms	5.	rooms
15.	Total number of groups (line 13 X line 14) rounded down to a whole number	22.	groups
16.	Actual number of groups per room (line 15 ÷ line 14)	4.4	groups
17.	Occupancy per room to farrow all groups (line 6 X line 16)	136.	days
18.	Extra time available in each farrowing room cycle (line 12 - line 17) ÷ line 16	.6	days
19.	Breeding cycle length [(line 6 ÷ line 14) + line 18] rounded up to a whole day	7.	days

ability to limit the length of the breeding period and the spread in the subsequent farrowing.

With conservative decisions on these matters, a single farrowing house cannot be scheduled more frequently than once every seven or eight weeks. However, by constructing a "compartmentalized" farrowing house (to allow all-in, all-out scheduling in each compartment) and by limiting the breeding period to a week or less, some producers have been able to use farrowing crates at five-week intervals.

Many producers have had trouble determining the number of groups of sows needed and the length of the breeding cycle. Because these decisions are the key to most schedules, a scheme is presented here for reasoning through the possibilities. The scheme is based on the development of the length of two cycles: a reproductive cycle for the sows and a cycle of farrowing room occupancy. The reproductive cycle of the sow will range in length from 140 to 180 days. The occupancy cycle for the farrowing house will normally range between 28 and 72 days. By dividing the longer cycle by the shorter one, you can calculate how many groups of sows can use a farrowing room so the last group is out of the way before the recycling first group is knocking on the door again.

Recording Form V-2 is a worksheet for determining the number of groups of sows needed (line 15) and the length of the breeding cycle (line 19). Included here are two examples of its use; blank forms are available. One example leads to the choice of three groups of sows and a 49-day (seven-week) cycle for the Bryan Dennis facilities shown in Exhibit V-1. The second example shows the choice of 22 sow groups and a weekly cycle for a unit with five farrowing rooms plus breeding facilities for hand-mating.

Here is some advice in using Recording Form V-2 as a worksheet:

--In calculating the length of the cycle of farrowing room occupancy (lines 1 through 6), think of your problem sow --the last sow to farrow in a group. On line 1, record the interval between the time of conception of the first sow in a group and the last. On line 2, record the minimum number of days before farrowing that a sow should be in a farrowing crate. On line 3, record the minimum suckling period in the farrowing house. Line 4 is the minimum days after weaning you want to permit a litter to stay in the farrowing crate. Line 5 is the required cleanup time for an <u>empty</u> room or building.

--In calculating the length of the reproductive cycle (lines 7 through 12) think of the fastest sow. The sow that conceives on the first day of breeding will also be first at the farrowing house door in the next cycle. On lines 8 and 9 list the minimum lactation time. On line 11, list the delay to later heat periods only if you insist upon such a delay for all sows.

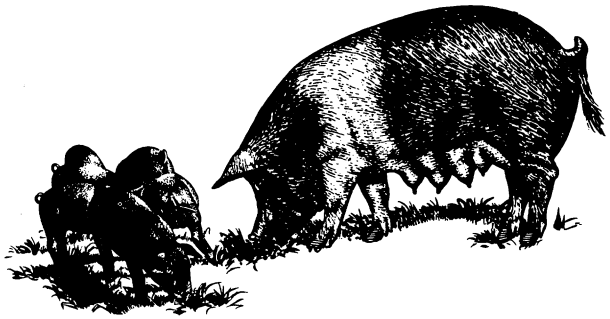
Having established the length of the breeding cycle (line 19), the producer can identify the various dates when breeding should begin. He will probably set breeding dates a year in advance. The breeding date is the base point for scheduling activities with the devices described in the next section.

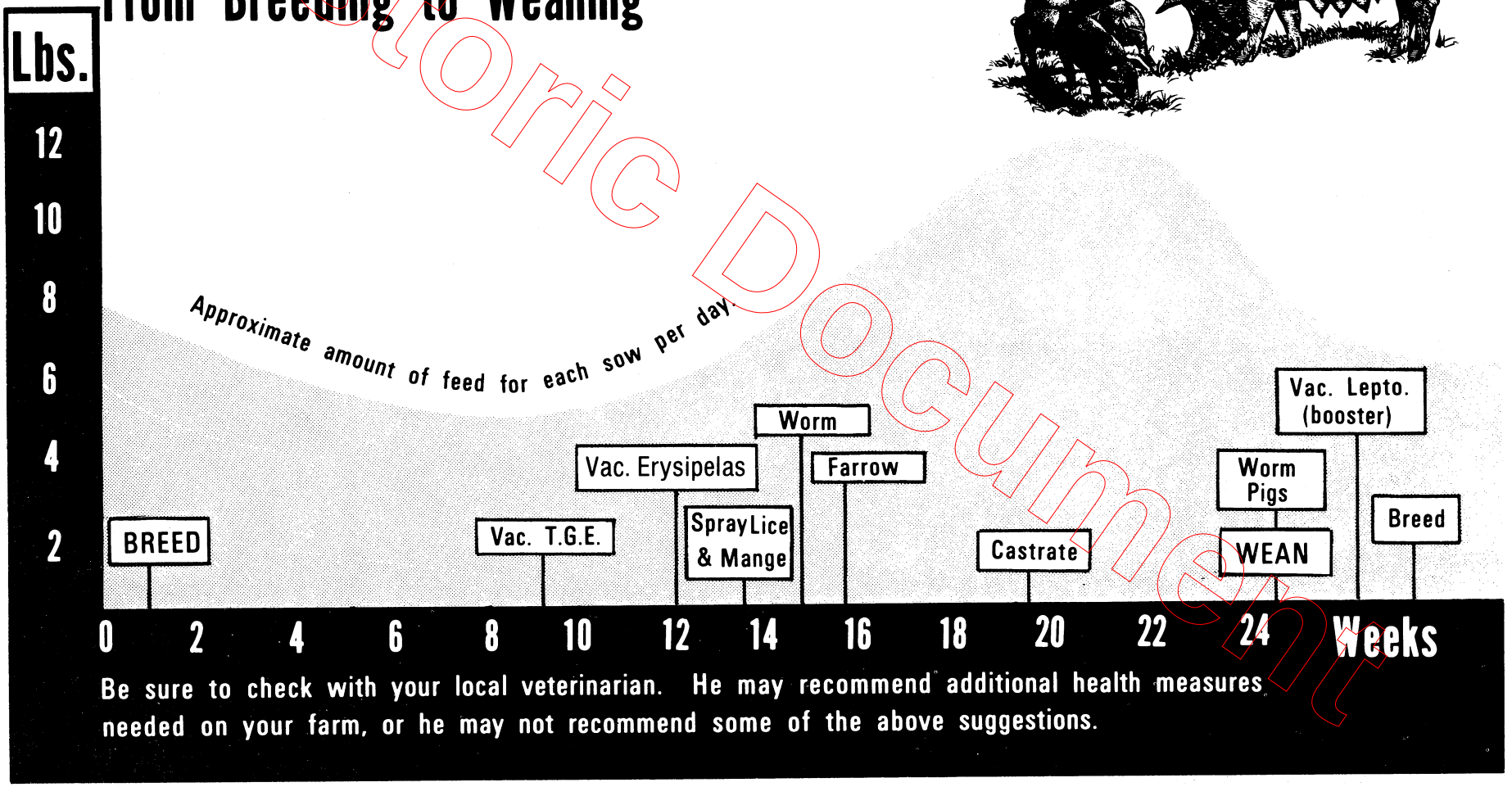
<u>Scheduling Activities</u>. There are two kinds of activities you need to schedule, those you can predict and those you cannot. Those two categories--the predictable and the unpredictable--will be discussed separately here.

The Predictable. When a sow is bred, the timing of a whole sequence of resulting activities is determined: look for heat in 21 days, pregnancy check in 35 days, prepare a farrowing crate in 110 days. And each individual producer will have a variety of other

Exhibit V-2

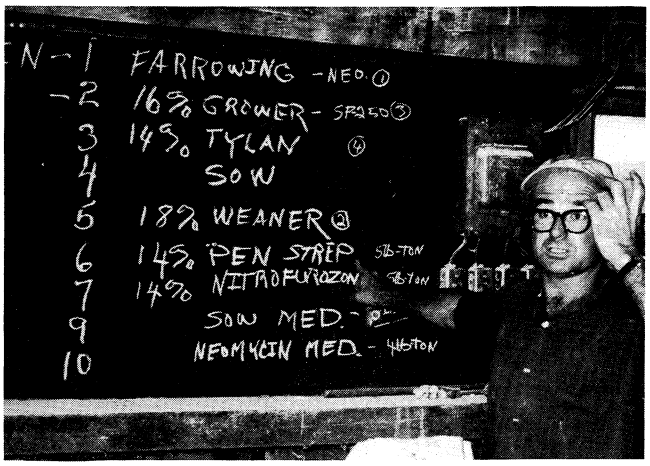
Daily Feed for Sows & Things to Do-- From Breeding to Weaning





Be sure to check with your local veterinarian. He may recommend additional health measures needed on your farm, or he may not recommend some of the above suggestions.

Extension Division, University of Missouri-Columbia



By using chalkboard paint, many producers have prepared surfaces at various spots in their hog buildings where they write messages.

activities keyed to the date of breeding: vaccination, spraying, worming, etc. Exhibit V-2 suggests the number of varied treatments and adjustments a producer might want to make as a sow cycles through the system. It is obvious from this that scheduling problems might become difficult to manage. Fortunately, most hog producers deal with sows as groups rather than as individuals. Still, the problem is not insignificant. For instance, a unit operating on a weekly farrowing schedule is likely to have 20 to 22 groups of sows, each on a different schedule, plus the pool of gilts and open sows.

To deal with the problem of scheduling activities, the producer needs a timing or calendar mechanism and a sow identification system which relates each group of sows to the calendar. Described here are three commonly used calendar mechanisms.

1. Calendar wheels come in two quite different designs. One type hangs on the wall and either groups of sows or individuals are recorded on the rotating wheel by positioning color-coded stickers at a spot indicating their stage in the reproductive cycle. The second type (sometimes called a carousel) is placed on a horizontal surface because it contains pockets to hold life history cards for individual sows.

With both types, the wheel is advanced one space each day and messages (e.g., breed, wean, worm, vaccinate, etc.) on the stationary base prompt the manager to take scheduled actions as the markers for a group of sows pass the indicated deadlines. The wall-hanging wheel provides a better visual appraisal of the scheduling situation and of problems, but it requires extra effort to prepare and move the color-coded stickers. The carousel, with its many pockets, provides for convenient sorting and storage of permanent sow records.

Both types of wheels may be more tedious than necessary. The idea of advancing a scheduling wheel daily probably suggests more precision than is possible, since sows are usually handled as groups rather than individuals. A recent modification of the scheduling wheel for units on a weekly farrowing schedule employs a tray with a pocket to hold the cards for each group of sows (probably 22 pockets). The pockets move through the tray in weekly steps and there are the same sort of management prompting messages on the rim of the tray as on the stationary base of the wheels.

You can use any of these devices. They provide a calendar system and a way to relate each ear tagged or branded sow to the calendar. In addition, the pockets built into some of the devices serve as a system for storing and sorting life history records. With either the carousel or tray, cards for open sows and gilts are in compartments outside the calendar mechanism. These cards must be searched regularly to detect animals that are not producing.

2. A computer program can also provide the calendar mechanism. Computers are good at counting. The computer must be given the breeding date, the desired interval between breeding and various events, and the proper instruc tions. Then it can readily produce lists of sows to be checked for return to estrus, to be pregnancy checked, to be moved to

farrowing, etc. Or, with a little different programming, a computer can print a daily work schedule.

The relationship between the individual animal and the calendar (computer) is established by entering sow identification and breeding date. Like the carousels and trays, the computer can serve as a storage device for life history data. In addition, it can prepare lists of open sows and report days open. To do this, open females must be identified with some tagging or marking system. And the computer needs weaning dates for sows and dates at which gilts become eligible for breeding.

3. The design and layout of the facilities can result in automatic production scheduling and, thereby, reduce the need for devices like scheduling wheels or computers. Almost every producer has some pens designed to perform specific functions such as farrowing, gestation, breeding, nursery. With modern production line buildings, the number of different specialized "function" pens has tended to increase. The building complex may be designed and arranged so animals physically proceed through the system and receive specified treatments (examples are breeding, heat checking, pregnancy checking, vaccination, ration change, drug withdrawal) when they change pens. Function pens or areas need not have design differences. For instance, simply lining up sows in gestation crates according to their breeding date is a great help in scheduling.

The idea here is that the facilities themselves can serve as a calendar mechanism. Animals are physically identified with the calendar (if a sow is in pen #12, she is due for a pregnancy check!). Among other things, function pens can serve to control the pool of gilts and open sows. The challenge is to avoid boarding unproductive animals. Individual identification and individual records can provide the necessary control; function pens can also if they permit you to segregate animals by age (gilts) or date of weaning (sows). If females are penned according to age or weaning date, it is simple to enforce a management rule to control the number open and not cycling. An example of such a rule is to market any animal not serviced four weeks after she became eligible for breeding.

Unlike the computer or the carousel or tray systems described earlier, this one does not provide for the storage of individual sow life history information. This will be of little consequence to those producers who don't feel they need written records of sow performance.[6] Some others have resolved the problem by moving the litter cards[7] through the system with the animals. Usually the cards for each sow in a pen are hung on a clipboard near the pen. Or individual sow cards may be hung above gestation crates by spring clothespins or similar devices.

To help in scheduling, you can choose among the three alternative calendar mechanisms. How do you choose the best one?

Even though the idea of function pens may not completely solve your scheduling problem, it is an idea that should have appeal. It will always be desirable to adopt building and pen designs that make possible and encourage proper and timely production procedures.

The computer and the scheduling wheel will be attractive to managers of large, intensive, multi-man units where it is important to develop strict routines and to exercise control. The choice between the scheduling wheel and the computer

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[6] See the description of the Minimum Level Program in EC-599, Records for Breeding Stock Selection and Culling.

[7] See Recording Form IV-1, Litter Card in EC-599, Records for Breeding Stock Selection and Culling.

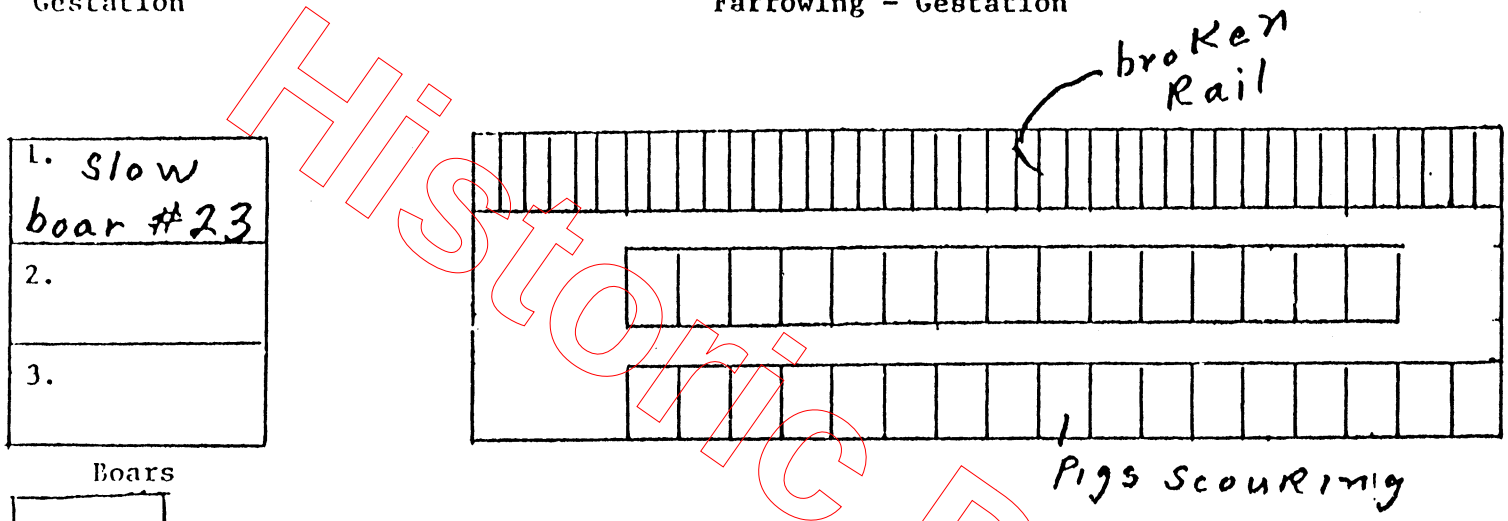
Exhibit V-3. Observation Worksheet.

Date March 25, 1982

Reporter - H. Higgins

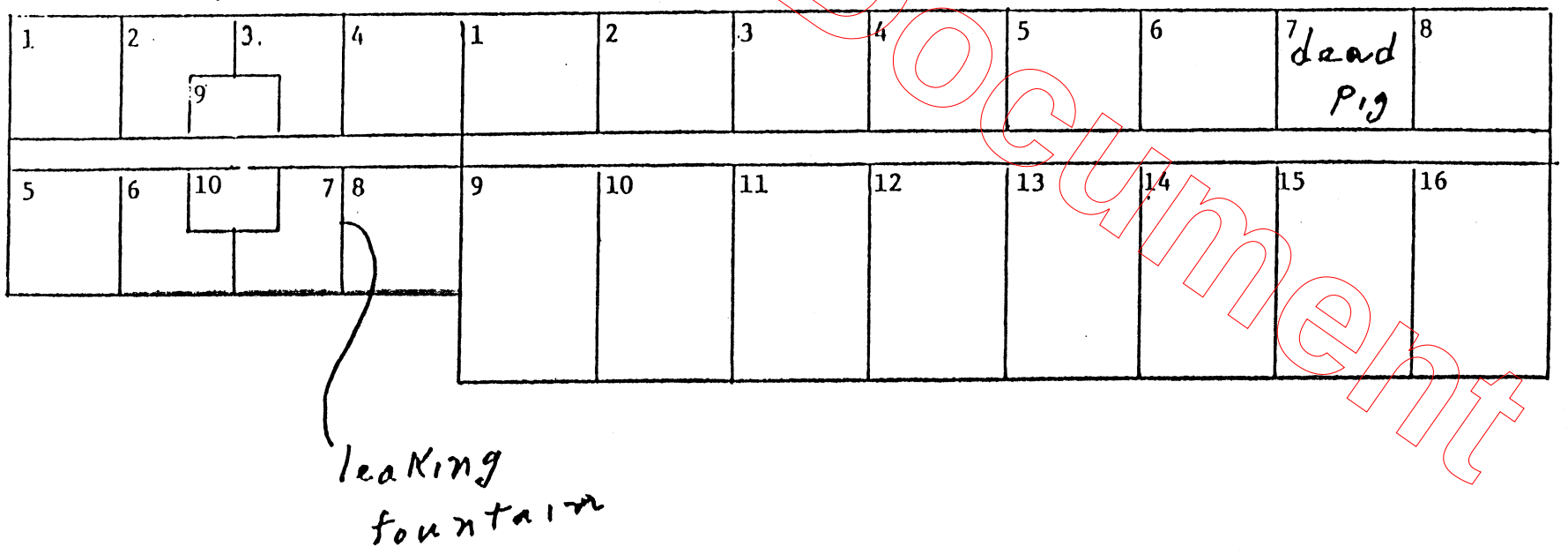
Breeding-
Gestation

Farrowing - Gestation



Nursery

Growing - Finishing



should not be made on the basis of their ability to help with scheduling. Either can handle that job adequately. The computer is a logical choice for a seed stock producer who wants to do pedigree work or for a manager who wants to develop a comprehensive system of business and swine production records. A well-programmed computer, because of its amazing ability to recall and to sort data, is especially valuable when there is a desire to use the same data in several different kinds of calculations and to generate several different reports.

The Unpredictable. You must also allocate time to deal with unpredicted, random and surprise events. These may be items needing attention but not urgent (fans need cleaning, finishing building partitions need repair, lanes need grading), or there may be a crisis (broken water pipe, dead boar, TGE).

The first piece of advice is to do whatever is possible to avoid crisis situations and to transform unpredictable events into predictable ones. A standby generator that will not start has no standby value! A fan that is regularly lubricated and cleaned is less likely to become a burned-out fan. Develop routine maintenance procedures.

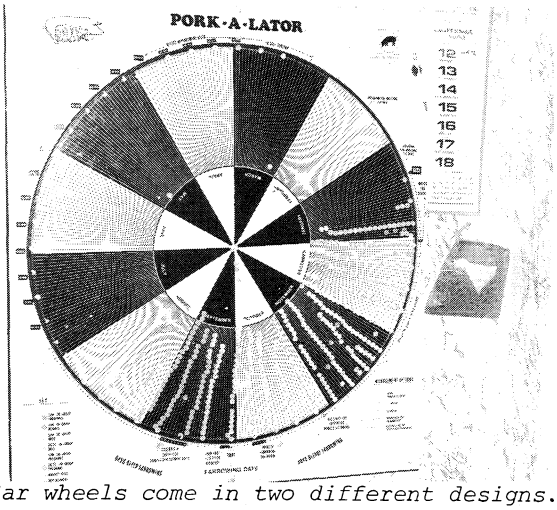
You cannot avoid all surprises, so a procedure is needed to detect problems and to see that action is taken. It is commonly agreed among hog producers that every animal should be seen two or three times daily by an interested and observant person. A good device to encourage observation and to help with the recording and communication of observed problems is a floor plan of the facilities. An example floor plan was shown as Exhibit V-1; it is reproduced here as Exhibit V-3 with some typical entries to illustrate its use for this purpose.

Finally, there should be a master job list conveniently placed to encourage new entries and for easy referral by manager and crew. One good form for a master job list is a large, desk-top calendar. Items can be brought to the master list from scheduling devices like the wheel or computer, from equipment maintenance schedules, from observation worksheets like Exhibit V-3. As jobs are delegated and performed, they are checked or lined out; unfinished jobs are rescheduled.

There have been several references in these last pages to equipment maintenance. This is a major concern in modern factory-like production units. A system is needed to help transform equipment failure crises into routine maintenance procedures. A good but simple system uses two devices:

--The desk-top calendar just described. When a new piece of equipment is purchased, the recommended servicing dates are noted on the calendar (e.g., clean and lubricate shutters each two months!). As pages from the current calendar are used up, they should be stapled to the back-end for storage. Last year's calendar is a source of valuable deadlines to be added to next year's.

--Manila folders or large envelopes. Label a folder or envelope for each major piece of equipment. File repair bills in these folders so there will be a history of what action was taken, when, and at what cost. This will be useful in deciding about further repair and replacement.



Calendar wheels come in two different designs.

NEW 1/84
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